


Seniority and Cosponsorship in the Chilean Lower House 2006-2018

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Table of Contents

1. Introduction
2. Theory
3. Empirical Strategy
4. Results and Discussion

Introduction

Introduction

Our main research questions are: **What drives a group of legislators to collaborate with others and jointly promote legislation? What underlying dynamics come into play in this situation?**

We rely on the Chilean case to answer them.

Theory

Theory and Empirical Expectations

Two identifiable perspectives. The first focuses on **aggregate behaviour between political parties and coalitions**. The second aims to identify the significance of the sponsorship by certain **individual characteristics and incentives**.

Based on the number of **terms a deputy has served** and his/her **level of sponsorship**, we might expect to find that Chilean deputies with greater experience or those with more significant sponsorship activity tend to isolate themselves in order to differentiate from other colleagues.

Congresspeople generally propose legislation that will benefit their electors: **pork barrel** (Balla and Nemacheck, 2000; Crisp et al., 2004; Koger, 2003; Mayhew, 1974). In Chile the **district incentive in this setting would not be significant or work inversely** (Navia et al., 2009; Siavelis, 2002). Nevertheless, it might affect **cooperation between deputies of contiguous districts**.

Theory and Empirical Expectations

H_1. The likelihood of cosponsoring bills is greater between deputies of the **same party** than the probability of cosponsorship between deputies of different parties.

H_2. The likelihood that **government deputies** cosponsor bills is greater than the probability that opposition deputies cosponsor bills.

H_3. The likelihood of **cosponsoring bills between government deputies** is greater than the probability of cooperative cosponsorship between government and opposition deputies.

Theory and Empirical Expectations

H_4. Deputies who have served a **greater number of terms** are less likely to create new ties for cosponsoring bills.

H_5. Deputies who have sponsored a **greater number of bills** during the previous congressional year are less likely to create new ties for cosponsoring bills.

H_6. The likelihood of cosponsoring bills is lower between deputies of the **same district** than the probability of cosponsorship between deputies of different districts.

H_7. The likelihood of cosponsoring bills is greater between deputies of **contiguous electoral districts** than the probability of cosponsorship between deputies from geographically distant districts.

Empirical Strategy

Data

We analyse bills (motions introduced by up to ten legislators) that were introduced in the Chilean Chamber of Deputies between 2006 and 2018. These three congressional periods are concurrent with the following presidential terms: Michelle Bachelet (2006-2010), Sebastián Piñera (2010-2014), Michelle Bachelet (2014-2018).

We have already collected data for the second term of Sebastián Piñera (2018-2022), but we are still preprocessing and cleaning.

We separate our data set by the congressional periods. Next, we divide each period to generate cosponsorship networks by year, therefore, we have four waves in each period for analysing with SAO models that measure the interaction of *i-th* deputies, specifically the changing dynamics in the cosponsorship ties of all members of the Chamber of Deputies ($n = 120$).

Data

We design three matrix grids to analyse the social networks and SAO models ($120 \times 120 \times 4$).

We incorporate an X_k vector in which *k-th* corresponded to the number of covariables employed. First, we use six time-invariant covariables ($120 \times 1 \times 6$): **political party**, a dummy of the governmental alignment of the **deputy's coalition** (government/opposition), **tenure** measured with the number of terms, **district**, **geographic region**, and **sex** as control.

Then, we incorporated a time-varying covariable ($120 \times 1 \times 4$): **one-year lagged sponsorship** (previous wave activity).

SNA and Stochastic Actor-Oriented Models

The social network analysis (SNA) is an approach that enables the observation of ties and measurement of interrelations of a specific group (Hanneman and Riddle, 2005; Wasserman and Faust, 1994). In this context, our empirical strategy is based on SAO models developed by Snijders (2001; see also Snijders et al., 2010b). This approach is part of the family of models for **dynamic networks that show changes in the networks**, between two discrete points of time, by examining the evolution of ties between the actors (Kalish, 2019; Pink et al., 2020).

The nodes represent actors and specific social relationships. In this framework, the probabilities of change may result from **endogenous factors**, as these may already be determined by the network structure or due to **exogenous factors**, resulting from the influence of node covariables (Snijders et al., 2010b).

SNA and Stochastic Actor-Oriented Models

To implement the SAO analysis, we employ Simulation Investigation for Empirical Network Analysis (**SIENA**; see Snijders, 2001; Snijders and Pickup, 2017; Snijders et al., 2010a).

We include an endogenous effect associated with **symmetrical networks**, which measures the ties' degree of activity and popularity.

Next, to test H_1 (same political party), H_3 (same coalition alignment as the government), H_6 (same district) and H_7 (geographically contiguous districts), we introduce to the **dyadic level** the covariate-related identity defined by the quantity of *i-th* connections to other nodes that share the same value in the covariable that is tested.

Further, for H_2 (government deputies), we assess the **individual level** with the covariate-related popularity effect, calculated by the sum of the covariables regarding all the actors with whom *i-th* has a tie.

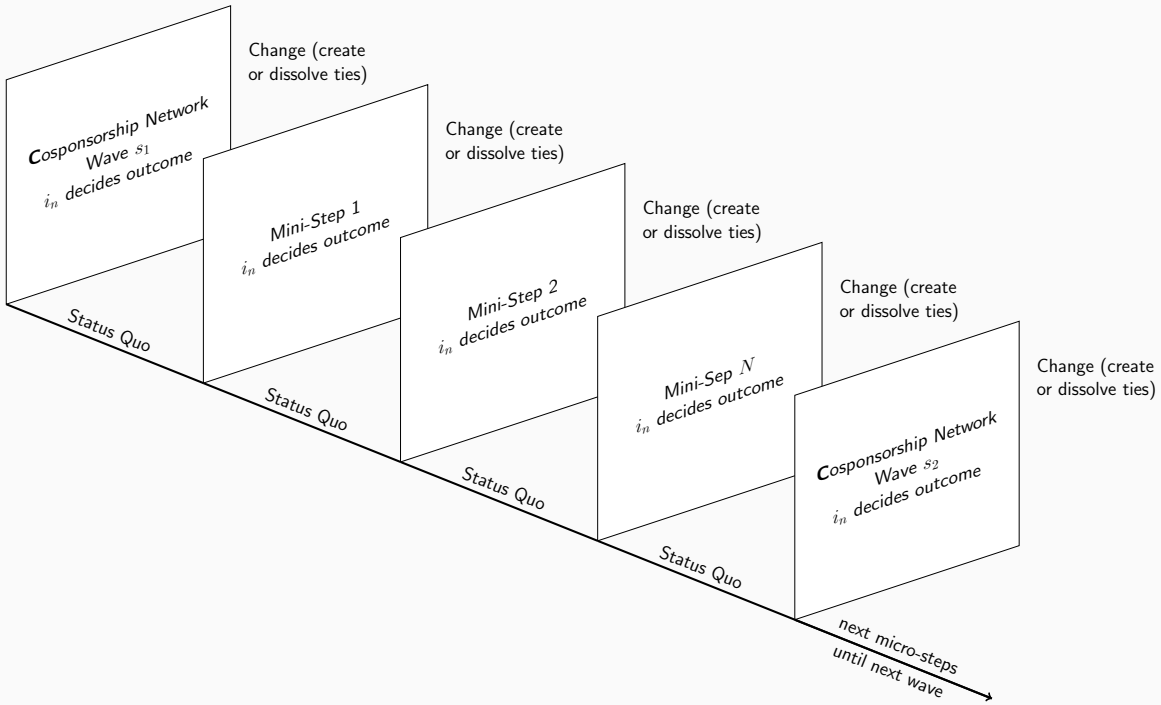
SNA and Stochastic Actor-Oriented Models

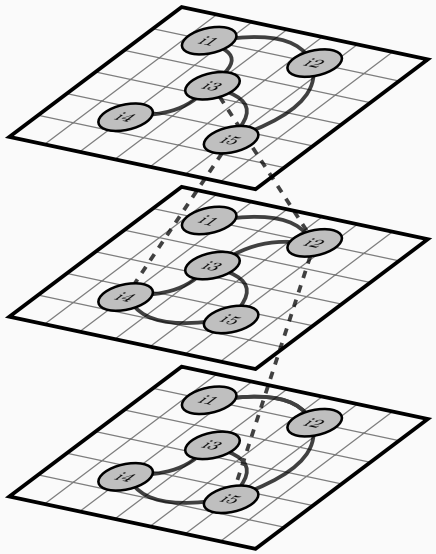
Finally, H_4 (tenure) and H_5 (lagged sponsorship), both related to individual career incentives, are assessed on both **individual and dyadic levels with a combination** of covariation of ego and the alter, based on the assumption that weighs similarly, since it is a symmetric network (non-directed ties).

The SAO analysis implies evaluating the evolution and formation of ties. Following Pink et al. (2020), between s_j and s_{j+1} there are three potential outcomes regarding the existing relation: (i) the creation of new ties; (ii) maintenance of the status quo; and (iii) dissolution of existing ties.

This decision occurs among what this approach calls **mini-steps calculated with simulations**, which consider potential decisions that an actor might make based on previous outcomes and the potential status of the social network that could be induced by possible actions by the individuals (Snijders, 2001; Snijders et al., 2010b, see also Pink et al., 2020).

Choice Modelling Networks Scheme





Results and Discussion

Descriptive Statistics on Networks

Network	Edges	Density	Jaccard Index $s_j - s_{j+1}$
$P_1 s_1$	3,261	0.448	0.471
$P_1 s_2$	3,602	0.496	0.309
$P_1 s_3$	3,099	0.424	0.212
$P_1 s_4$	2,394	0.324	
$P_2 s_1$	3,050	0.418	0.502
$P_2 s_2$	3,818	0.529	0.388
$P_2 s_3$	3,470	0.477	0.213
$P_2 s_4$	2,829	0.386	
$P_3 s_1$	3,328	0.457	0.471
$P_3 s_2$	3,554	0.489	0.371
$P_3 s_3$	3,156	0.433	0.382
$P_3 s_4$	2,970	0.406	

J-Index enables the assessment of the stability of cosponsorship among networks. Substantial changes in ties took place in the third year of Bachelet and Piñera. Moreover, in the second year of those two periods, networks increased dramatically. This may be attributed to the **flashpoint of legislative production**: sufficient time after the government's inauguration and the beginning of the new legislature and sufficiently before the next elections.

SAO Models for Cosponsorship

	Model P_1 (2006-2010)	Model P_2 (2010-2014)	Model P_3 2014-2018)
Rate of cosponsorship formation			
$s_1 - s_2$	45.936	49.403	39.849
	(2.295)	(2.620)	(1.797)
$s_2 - s_3$	44.945	37.287	38.724
	(2.210)	(1.522)	(1.695)
$s_3 - s_4$	45.484	38.855	36.878
	(2.091)	(1.515)	(1.525)
Structural effects			
Degree (density)	–2.539***	–2.494***	–2.588***
	(0.065)	(0.064)	(0.067)
Constraint of degree activity	0.012***	0.012***	0.013***
	(0.000)	(0.000)	(0.000)
Dyad-level covariates			
Same political party	1.022***	0.813***	0.996***
	(0.032)	(0.032)	(0.034)

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

SAO Models for Cosponsorship

Same coalition (officialism/opposition)	0.459^{***}	0.360^{***}	0.294^{***}
	(0.022)	(0.022)	(0.022)
Same district	0.074	0.237^{*}	0.067
	(0.104)	(0.107)	(0.109)
Same region (contiguous districts)	0.081^{**}	0.114^{***}	0.196^{***}
	(0.029)	(0.030)	(0.031)
Individual-level covariate			
Coalition (officialism/opposition)	0.168^{***}	-0.265^{***}	0.179^{***}
	(0.029)	(0.025)	(0.028)
Individual-dyad covariates			
Tenure	-0.034^{***}	-0.024^{***}	-0.005
	(0.005)	(0.004)	(0.004)
Lagged sponsorship	-0.002^{***}	-0.005^{***}	-0.001^{**}
	(0.000)	(0.000)	(0.000)
Control			
Sex	Yes	Yes	Yes
Iteration steps	2,926	2,726	2,799
Convergence t ratios	< 0.070	< 0.040	< 0.060
Avg. max convergence ratio	0.135	0.066	0.094

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

SAO Findings

Structural effects. The rates between waves suggest between 37 and 49 opportunities to decide to change a cosponsorship tie. The dispersion of the deputies' degrees is unrestricted ($p < 0.001$; $p < 0.001$; $p < 0.001$). Therefore, it is common for a deputy to have a **high number of ties**, despite the significant negative coefficients of the **density parameters** (in the absence of other effects, it is unlikely that two deputies randomly generate a cosponsorship tie).

Covariables effects on the dyadic level. The previous evidence leads us to **confirm our H_1 hypothesis (same political party)**, **H_3 (same coalition alignment as the government)** and **H_7 (geographically contiguous districts)**.

SAO Findings

However, we **reject H_6 (same district)** because our original empirical expectation was the same district lower the probabilities of establishing ties.

Individual level. The evidence leads us to **confirm that H_2 (government deputies)** is a significant variable only in congressional periods concurrent with **centre-left governments**.

Social interactions of individuals. These outcomes enable us to **confirm H_4 (tenure) partially**, and we **confirm H_5 (lagged sponsorship)** as they meet our empirical expectations in the expected direction.

Discussion

Our descriptive results suggest that deputies have different levels of cosponsorship activity. In general, we can see **greater cosponsorship as of the second year** of each period analysed, which is consistent with the development of the presidential agenda.

An eye-catching outcome was that **district concordance does not have a significant effect on cosponsorship**, except for the congressional period parallel to the first government of Sebastián Piñera. Two tentative explanations for this anomaly can be discerned. First, this **strange pork barrel-style** conduct might be associated with regional and local consequences of the **earthquake of 2010**. Reconstructing the country took years, so the collaboration is coherent.

Discussion

The second explanation is that **law-making logic and strategies differed** from the patterns observed during previous governments during that period. For the first time in thirty years, a coalition of political parties of the right secured the presidency, and the central-left coalition became the legislative opposition.

To confirm this, we will analyse the congressional period concurrent with Piñera's second term (which ended last March).

Other interesting results are that seniority produces isolation in cosponsorship dynamics regarding the individual career incentives. Indeed, deputies with more experience in the chamber tend to be more selective (**differentiation strategy**).

Acknowledgements, References and Contact Information

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Thank you very much!